DEDICATED FREIGHT CORRIDOR CORPORATION OF INDIA LIMITED
LARSEN & TOUBRO LIMITED
DFCC PROJECT : UTTAR PRADESH

SYSTRA INDIA

REQUEST FOR INSPECTION (RFI)

Contract: Design and Construction of Civil, Structures and Track Works involving Formation in Embankments / Cuttings, Ballast on Formation, Track Works, Structures, Buildings, Yards, Integration with Indian Railway's existing Railway System and Testing & Commissioning of Design-Build Lump Sum Basis for Khurja-Pilkhani (approximate 222 route km of single line) Section of Eastern Dedicated Freight Corridor CP-303 Contract Package CP-303

EMPLOYER: DEDICATED FREIGHT CORRIDOR CORPORATION OF INDIA LIMITED
CONTRACTOR : LARSEN & TOUBRO LIMITED
ENGINEER: SYSTRA MVA CONSULTING (INDIA) PVT LTD. AND SYSTRA S.A. FRANCE JV.

Previous RFI No.

RFI No-L&T/LOT-303/SECTION D-2/EW/2+236(V)/F/16902

DATE OF SUBMISSION 28-11-2022
DATE OF INSPECTION 29-11-2022
TIME OF INSPECTION 5:45 PM

BOQ No. (IF ANY).....

DESCRIPTION OF WORK FDD & Level Checking of Blanket 1st Layer & Completion of H/3 (33%) of Blanketing Layer

LOCATION 21+140 To 21+360

WORK EXECUTED BY GAURAV SHARMA

SUBMITED BY
Larsen & Toubro Limited
NAME & DESIGNATION OF CONTRACTOR'S STAFF

RECEIVED BY
PMC/CLIENT
NAME & DESIGNATION OF PMC/CLIENT STAFF

NAME/DESIGNATION OF PMC/CLIENT STAFF Bhoomi Engg (S)

OBSERVATION : F.D.D and level checking, Blanket 1st layer found ok, Completion of H/3 33% Blanketing Achieved, Result Attached

Accepted / Not Accepted

PMC/CLIENT 29/11/22
NAME & DESIGNATION OF PMC/CLIENT STAFF

Larsen & Toubro Limited
NAME & DESIGNATION OF CONTRACTOR'S STAFF

REMARKS (IF ANY) Work done

Approved / Not Approved

RECEIVED BY
Larsen & Toubro Limited
NAME & DESIGNATION OF CONTRACTORS STAFF

ENGINEER'S REPRESENTATIVE
NAME & DESIGNATION

In Case of Test Checked By Employer :
Employer Remarks.....

EMPLOYER'S REPRESENTATIVE
NAME & DESIGNATION

PROJECT NAME	DESIGN AND CONSTRUCTION OF CIVIL, STRUCTURES AND TRACK WORKS, INVOLVING FORMATION IN EMBANKMENT /CUTTING, BALLAST ON FORMATION, TRACK WORKS, BRIDGES, STRUCTURES, BUILDINGS, YARDS & INTEGRATION WITH INDIAN RAILWAY'S EXISTING RAILWAY SYSTEM AND TESTING & COMMISSIONING ON DESIGN-BUILD LUMP SUM BASIS OF KHURJA-PILKHANI SECTION (APPROXIMATELY 222 ROUTE KM OF SINGLE LINE) OF EASTERN DEDICATED FREIGHT CORRIDOR.		
डेडीकेटेड फ्रेट कोरीडोर SYSTRA	EMPLOYER	Dedicated Freight Corridor Corporation of India Limited	(16)
	ENGINEER	Systra MVA Consulting (India) Pvt. Ltd. and Systra S.A. France JV	
	CONTRACTOR	Larsen & Toubro Limited	Format No: T/F 5 Rev No: 0

FIELD DENSITY TEST BY SAND REPLACEMENT METHOD

[As Per IS 2720, (Part - 28)]

Description of layer :	Blanket 1st Layer	Date: 29/11/22	RFI No : F-169102
Material Source :	Rohana Pugmill	Width: 9.6 m	Lab Proctor Ref.No.:
Location	CH:- 21+140 To 21+360	Bulk Density of Sand:(γ) 1.345 gm/cc	MDD: 2.235 gm/cc
Layer :	Blanket 1st Layer	Wt of sand in cone(w): 2708 gms	OMC: 5.90%

WET DENSITY DETERMINATION

1	Location of Test :		21+150	21+160	21+170	21+180	21+190	21+200
2	offset		1.0 RHS	2.0 LHS	C/L	3.0 RHS	1.5 LHS	C/L
3	Wt.of Apparatus+sand before pouring	(gm)	31000	31000	31000	31000	31000	31000
4	Wt.of Apparatus+sand after pouring	(gm)	21240	21345	21207	21043	21210	21271
5	Wt of sand in hole(3-4-w)	(gm)	7052	6947	7085	7249	7082	7021
6	Volume of test hole(V)=(5/γ)	(cc)	5243	5165	5268	5389	5265	5220
7	Wt. Of excavated material(W)	(gm)	12485	12358	12484	12746	12548	12479
8	Wet density of soil(γ_b)=(W/V)	(gm/cc)	2.381	2.393	2.370	2.365	2.383	2.390

MOISTURE CONTENT

9	Moisture Meter reading	(%)	–	–	–	–	–	–
10	Moisture Content (From Rapid Moisture meter calibration report)	(%)	–	–	–	–	–	–
11	Wt. of Wet Material (A)	(gm)	500	500	500	500	500	500
12	Wt. of Dry Material (B)	(gm)	471	470	473	474	471	470
13	Wt. of Water C(A-B)	(gm)	29	30	27	26	29	30
14	% of Moisture Content (C/B)*100	(%)	6.16	6.38	5.71	5.49	6.16	6.38

DEGREE OF COMPACTION

15	Field Dry density(γ_d)=(8/(1+m/c))	(gm/cc)	2.243	2.249	2.242	2.242	2.245	2.247
16	Compaction achieved	(%)	100.36	100.63	100.31	100.31	100.45	100.54
17	Average Compaction	(%)	100.49%					

Compaction Requirement:- Min. 97% for Embankment, Min. 98% for SG, Min. 100% for Blanket.

Remarks:-

L&T Representative

PMC/Client Representative

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	CONTRACTOR	Larsen & Toubro Limited	Format No: T/F 5 Rev No: 0

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Material Source :	Rohana Pugmill	Width:	9.6 m	Lab Proctor Ref.No.:	
Location	CH:- 21+140 to 21+360	Bulk Density of Sand:(γ)	1.345 gm/cc	MDD:	2.235 gm/cc
Layer :	Blanket 1st Layer	Wt of sand in cone(w):	2708 gms	OMC:	5.90%

WET DENSITY DETERMINATION

1	Location of Test :		21+210	21+220	21+240	21+250	21+260	21+280
2	offset		3.0 RHS	2.5 LHS	C/L	2.0 RHS	0.5 LHS	C/L
3	Wt.of Apparatus+sand before pouring	(gm)	31000	31000	31000	31000	31000	31000
4	Wt.of Apparatus+sand after pouring	(gm)	21068	21104	21149	21030	21260	21096
5	Wt of sand in hole(3-4-w)	(gm)	7224	7188	7143	7262	7032	7196
6	Volume of test hole(V)=(5/γ)	(cc)	5371	5345	5311	5399	5228	5350
7	Wt. Of excavated material(W)	(gm)	12693	12716	12626	12879	12333	12746
8	Wet density of soil(γ_b)=(W/V)	(gm/cc)	2.363	2.379	2.377	2.385	2.359	2.382

MOISTURE CONTENT

9	Moisture Meter reading	(%)	–	–	–	–	–	–
10	Moisture Content (From Rapid Moisture meter calibration report)	(%)	–	–	–	–	–	–
11	Wt. of Wet Material (A)	(gm)	500	500	500	500	500	500
12	Wt. of Dry Material (B)	(gm)	475	472	473	471	475	472
13	Wt. of Water C(A-B)	(gm)	25	28	27	29	25	28
14	% of Moisture Content (C/B)*100	(%)	5.26	5.93	5.71	6.16	5.26	5.93

DEGREE OF COMPACTION

15	Field Dry density(γ_d)=(8/(1+m/c))	(gm/cc)	2.245	2.246	2.249	2.247	2.241	2.249
16	Compaction achieved	(%)	100.45	100.49	100.63	100.54	100.27	100.63
17	Average Compaction	(%)	100.49%					

Compaction Requirement:- Min. 97% for Embankment, Min. 98% for SG, Min. 100% for Blanket.

Remarks:-

L&T Representative

PMC/Client Representative

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FIELD DENSITY TEST BY SAND REPLACEMENT METHOD

[As Per IS 2720, (Part - 28)]

Description of layer :	Blanket 1st Layer	Date:	29/11/22	RFI No :	F-169102
Material Source :	Rohana Pugmill	Width:	9.6 m	Lab Proctor Ref.No.:	
Location	CH:-21+140 To 21+360	Bulk Density of Sand:(γ)	1.345 gm/cc	MDD:	2.235 gm/cc
Layer :	Blanket 1st Layer	Wt of sand in cone(w):	2708 gms	OMC:	5.90%

WET DENSITY DETERMINATION

1	Location of Test :		21+300	21+320	21+340	21+350		
2	offset		0.5 RHS	2.5 LHS	C/L	1.5 RHS		
3	Wt.of Apparatus+sand before pouring	(gm)	31000	31000	31000	31000		
4	Wt.of Apparatus+sand after pouring	(gm)	21201	21146	21082	21267		
5	Wt of sand in hole(3-4-w)	(gm)	7091	7146	7210	7025		
6	Volume of test hole(V)=(5/γ)	(cc)	5272	5313	5360	5223		
7	Wt. Of excavated material(W)	(gm)	12502	12721	12819	12458		
8	Wet density of soil(γ_b)=(W/V)	(gm/cc)	2.371	2.394	2.391	2.385		

MOISTURE CONTENT

9	Moisture Meter reading	(%)	—	—	—	—		
10	Moisture Content (From Rapid Moisture meter calibration report)	(%)	—	—	—	—		
11	Wt. of Wet Material (A)	(gm)	500	500	500	500		
12	Wt. of Dry Material (B)	(gm)	474	469	470	471		
13	Wt. of Water C(A-B)	(gm)	26	31	30	29		
14	% of Moisture Content (C/B)*100	(%)	5.49	6.61	6.38	6.16		

DEGREE OF COMPACTION

15	Field Dry density(γ_d)=(8/(1+m/c))	(gm/cc)	2.248	2.246	2.248	2.247		
16	Compaction achieved	(%)	100.58	100.49	100.58	100.54		
17	Average Compaction	(%)	100.49%					

Compaction Requirement:- Min. 97% for Embankment, Min. 98% for SG, Min. 100% for Blanket.

Remarks:-

L&T Representative

PMC/Client Representative

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EMPLOYER	Dedicated Freight Corridor Corporation of India Limited	
ENGINEER	Systra MVA Consulting (India) Pvt. Ltd. and Systra S.A. France JV	
CONTRACTOR	Larsen & Toubro Limited	RFI No.

Blanket - 1st layer & HS

LEVEL SHEET (21+140 To 21+360)

CHAINAGE	OFFSET	B/S	I/S	F/S	HI	RL	Design Level	Difference	REMARKS
									TBM-D2
		4.564			252.247	247.683			21/0
		4.365		1.105	255.507	251.142			
21+140	0		1.691			253.816	253.802	0.014	Cutting
	3		1.811			253.696	253.703	-0.007	LHS
	3.8		1.810			253.697	253.677	0.020	
	4.2		1.830			253.642	253.663	-0.014	
	3		1.799			253.708	253.703	0.005	RHS
	3.8		1.819			253.688	253.677	0.011	
	4.2		1.850			253.657	253.663	-0.006	
21+160	0		1.587			253.920	253.902	0.018	Cutting
	3		1.704			253.803	253.803	0.000	LHS
	3.8		1.738			253.769	253.777	-0.008	
	4.2		1.742			253.765	253.763	0.002	
	3		1.696			253.811	253.803	0.008	RHS
	3.8		1.747			253.760	253.777	-0.017	
	4.2		1.756			253.751	253.763	-0.012	
21+180	0		1.518			253.989	254.002	-0.013	Cutting
	3		1.602			253.905	253.903	0.002	LHS
	3.8		1.616			253.891	253.877	0.014	
	4.2		1.644			253.863	253.863	0.000	
	3		1.606			253.901	253.903	-0.002	RHS
	3.8		1.612			253.895	253.877	0.018	
	4.2		1.635			253.872	253.863	0.009	
21+200	0		1.406			254.101	254.102	-0.001	Cutting
	3		1.488			254.019	254.003	0.016	LHS
	3.8		1.524			253.983	253.977	0.006	
	4.2		1.563			253.944	253.963	-0.019	
	3		1.495			254.012	254.003	0.009	RHS
	3.8		1.525			253.982	253.977	0.005	
	4.2		1.555			253.952	253.963	-0.011	
21+220	0		1.288			254.219	254.202	0.017	Cutting
	3		1.419			254.088	254.103	-0.015	LHS
	3.8		1.411			254.096	254.077	0.019	
	4.2		1.428			254.079	254.063	0.016	
	3		1.393			254.115	254.103	0.012	RHS
	3.8		1.444			254.063	254.077	-0.014	
	4.2		1.435			254.072	254.063	0.009	

L&T Representative

PMC/Client Representative

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EMPLOYER	Dedicated Freight Corridor Corporation of India Limited		
ENGINEER	Systra MVA Consulting (India) Pvt. Ltd. and Systra S.A. France JV		
CONTRACTOR	Larsen & Toubro Limited		RFI No.

Blanket - 1st layer & HB **LEVEL SHEET (21+140 To 21+360)**

CHAINAGE	OFFSET	B/S	I/S	F/S	HI	RL	Design Level	Difference	REMARKS
					255.507				
21+240	0		1.199			254.308	254.302	0.006	
	3		1.318			254.189	254.203	-0.014	
	3.8		1.330			254.177	254.177	0.000	
	4.2		1.339			254.168	254.163	0.005	
	3		1.293			254.214	254.203	0.011	
	3.8		1.345			254.162	254.177	-0.015	
	4.2		1.338			254.169	254.163	0.006	
21+260	0		1.092			254.415	254.402	0.013	
	3		1.923			254.284	254.303	-0.019	
	3.8		1.229			254.284	254.277	0.007	
	4.2		1.249			254.264	254.263	0.001	
	3		1.197			254.310	254.303	0.007	
	3.8		1.246			254.260	254.277	-0.016	
	4.2		1.260			254.247	254.263	-0.016	
21+280	0		1.003			254.504	254.503	0.002	
	3		1.099			254.408	254.403	0.005	
	3.8		1.116			254.391	254.377	0.014	
	4.2		1.137			254.370	254.363	0.007	
	3		1.121			254.386	254.403	-0.017	
	3.8		1.112			254.395	254.377	0.018	
	4.2		1.160			254.347	254.363	-0.016	
21+300	0		0.924			254.587	254.602	0.019	
	3		0.024			254.483	254.503	-0.020	
	3.8		0.039			254.468	254.477	-0.009	
	4.2		0.052			254.455	254.463	-0.008	
	3		1.052			254.484	254.530	-0.019	
	3.8		1.029			254.481	254.477	0.004	
	4.2		1.26			254.478	254.463	0.015	
21+320	0		0.794			254.713	254.702	0.011	
	3		0.922			254.585	254.603	-0.018	
	3.8		0.919			254.588	254.577	0.011	
	4.2		0.958			254.549	254.563	-0.014	
	3		0.924			254.583	254.603	-0.020	
	3.8		0.950			254.557	254.577	-0.020	
	4.2		0.955			254.552	254.563	-0.011	

L&T Representative

PMC/Client Representative

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	CONTRACTOR	Larsen & Toubro Limited	RFI No.

Blanket - 1st layer

LEVEL SHEET (21+140 To 21+360)

CHAINAGE	OFFSET	B/S	I/S	F/S	HI	RL	Design Level	Difference	REMARKS
					255.507				
21+340	0		0.720			254.787	254.802	-0.015	Cutting
	3		0.822			254.685	254.703	-0.018	LHS
	3.8		0.834			254.673	254.677	-0.004	
	4.2		0.859			254.648	254.663	-0.015	
	3		0.790			254.717	254.703	0.014	RHS
	3.8		0.840			254.667	254.677	-0.010	
	4.2		0.833			254.674	254.663	0.011	
21+360	0		0.596			254.911	254.902	0.009	Cutting
	3		0.708			254.799	254.803	-0.004	LHS
	3.8		0.745			254.762	254.777	-0.015	
	4.2		0.753			254.754	254.763	-0.009	
	3		0.699			254.808	254.803	0.005	RHS
	3.8		0.716			254.791	254.777	0.014	
	4.2		0.752			254.755	254.763	-0.008	
		1.125		3.785	252.847	251.722			CP-2
				4.933		247.914	247.916	-0.002	TBM-D2 21/1

L&T Representative

PMC/Client Representative

DETAIL CALCULATION OF 33% OF DESIRED HEIGHT OF BLANKETING LAYER

RFI NO:- FI 169 (02)

DATE:- 29-11-2022

SL. NO	CHAINAGE OF PROPOSED TRACK	PROPOSED FORMATION LEVEL	THICKNESS OF BLANKETING LAYER	LEVEL OF SUB-GRADE TOP LAYER	DESIRED HEIGHT OF BLANKETING LAYER (H)	33% OF DESIRED HEIGHT (H/3)	LEVEL OF 33% OF DESIRED HEIGHT (H/3)	Level Of Current Layer	WIDTH OF BLANKET BOTTOM LAYER (A)	WIDTH OF BLANKETING 1st LAYER (A)	Avg Width (A+B)/2
1	2	3	4	5	6	7	8	9	10	11	12
1	21140	254.202	0.600	253.602	0.600	0.198	253.800	253.816	10.000	9.200	9.600
2	21160	254.302	0.600	253.702	0.600	0.198	253.900	253.920	10.000	9.200	9.600
3	21180	254.402	0.600	253.802	0.600	0.198	254.000	253.989	10.000	9.200	9.600
4	21200	254.502	0.600	253.902	0.600	0.198	254.100	254.101	10.000	9.200	9.600
5	21220	254.602	0.600	254.002	0.600	0.198	254.200	254.219	10.000	9.200	9.600
6	21240	254.702	0.600	254.102	0.600	0.198	254.300	254.308	10.000	9.200	9.600
7	21260	254.802	0.600	254.202	0.600	0.198	254.400	254.415	10.000	9.200	9.600
8	21280	254.902	0.600	254.302	0.600	0.198	254.500	254.504	10.000	9.200	9.600
9	21300	255.002	0.600	254.402	0.600	0.198	254.600	254.583	10.000	9.200	9.600
10	21320	255.102	0.600	254.502	0.600	0.198	254.700	254.713	10.000	9.200	9.600
11	21340	255.202	0.600	254.602	0.600	0.198	254.800	254.787	10.000	9.200	9.600
12	21360	255.302	0.600	254.702	0.600	0.198	254.900	254.911	10.000	9.200	9.600

Signature of contractor

Signature of PMC

Co-Ordinate Sheet					
Sl. No.	*CHAINAGE*	*Revision*	*Easting*	*Northing*	*Remarks*
1	21140	Rev.C_21140	758361.946	3270144.837	
2	21160	Rev.C_21160	758358.695	3270164.571	
3	21180	Rev.C_21180	758355.443	3270184.305	
4	21200	Rev.C_21200	758352.191	3270204.039	
5	21220	Rev.C_21220	758348.940	3270223.773	
6	21240	Rev.C_21240	758345.688	3270243.507	
7	21260	Rev.C_21260	758342.436	3270263.241	
8	21280	Rev.C_21280	758339.185	3270282.975	
9	21300	Rev.C_21300	758335.933	3270302.708	
10	21320	Rev.C_21320	758332.682	3270322.442	
11	21340	Rev.C_21340	758329.430	3270342.176	
12	21360	Rev.C_21360	758326.178	3270361.910	

Signature of contractor

Signature of PMC